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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TUCKER, ZACHARY C

ART UNIT	PAPER NUMBER
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1624

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/664,307

Applicant(s)

OOMS ET AL.

Examiner

Zachary C. Tucker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 17Sep03, 19Jul04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Indefinite language is recited in instant claim 1, as explained in the following.

Because all claims 2-10 depend directly or indirectly from claim 1, all claims are indefinite.

The last line of claim 1 on page 20 of the original claims, which reads "or mixtures of dibenzyl ethers and benzyl alcohols of the formula" is not clear and well-defined because the structure of the dibenzyl ethers referred to is not known. These dibenzyl ethers, in mixture with the benzyl alcohols of a defined structural formula (depicted on following page 21) are not limited by the structure of dibenzyl ethers which is depicted in the preceding lines of claim 1. A recitation of "dibenzyl ethers" by itself does not describe any particular type of dibenzyl ether, only that the compound is an ether, that is, it comprises at least one C—O—C functional group and that there be two benzyl groups in the molecule. A "dibenzyl ether" could refer also to a compound whose molecular structure comprises *two* separate benzyl ether functions, -O-CH<sub>2</sub>-Ph.

It is therefore unclear whether or not applicants intended for this recitation to refer to "mixtures of *such* dibenzyl ethers" (where *such* refers to the structurally defined

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dibenzyl ethers in the preceding lines of claim 1) or if indeed, applicants intended for this second recitation of dibenzyl ethers to be broader in scope than the first, to refer to any ether compound that has two benzyl groups or to a compound comprising two separate benzylic ether functions.

Because it seems that the former is the case ("*such* dibenzyl ethers"), the instant claims have been searched insofar as the dibenzyl ether reactant is of the structural formula depicted in claim 1.

Claim 2 is found to be further indefinite under 35 U.S.C. 112, second paragraph, in addition to depending from claim 1, which is indefinite, for specifying the pH of a compound. *Solutions* of acidic or basic compounds have a pH, which is the negative log of the hydrogen ion concentration in Moles, but a compound *per se*, that is a molecule, cannot have a pH. Claim 2 has been examined on the merits as though some solution having the specified pH value could be made with the acid recited in claim 1. The examiner advises against replacing "pH" with "pKa", which is the appropriate parameter for expressing a Brønsted acid's relative strength, because a) there does not appear to be any support for such an amendment in the specification, and b) many of the preferred acids, recited in claim 3, have negative pKa values (strong acids), which are not in the range of from 1 to 6.

Claim 10 is found to be further indefinite under 35 U.S.C. 112, second paragraph, in addition to depending from claim 1, which is indefinite, for recitation of "sulphated oxide." The term does not make clear what the "oxide" is an oxide of. For example, does the term refer to metal oxides or oxides of non-metals? In the specification, at

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page 9, lines 24-26, several compounds are listed as exemplary "sulphated oxides."

None of these exemplary sulphated oxides are actually a sulphated form of an oxide of some element. So, the specification does not aid in determining what applicants intend the term to signify. Claim 10 has not been further examined on the merits in this Office action, as it would be overly speculative for the examiner to guess what applicants intended to the term "sulphated oxide" to stand for.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Clark, G. S. "Benzyl Acetate" Perfumer and Flavorist, vol. 14, pages 25, 26, 28-30, 32 and 34 (September 1989).

The Clark reference discloses on page 28 (above the "Fontarôme" advertisement) that Trubek Labs was the only manufacturer to employ the synthesis of benzyl acetate from dibenzyl ether and acetic anhydride, with *p*-toluene sulfonic acid as catalyst.

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Such a process anticipates the indicated claims, because *p*-toluene sulfonic acid is, of course, an acid, and is recited in instant claim 3, as "4-toluenesulphonic acid." *p*-Toluenesulfonic acid has a pKa of about  $-1.34$ , so a solution of it could be made having a pH in the range specified in claim 2. Acetic anhydride is an anhydride specified in claim 1, wherein R<sup>4</sup> is methyl and benzyl acetate, the corresponding carboxylic acid benzyl ester, is one according to that claim wherein R<sup>4</sup> is also methyl.

Claims 1, 2 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ondruschka et al, "Benzylacetat aus Dibenzylether" Journal für Praktische Chemie, vol. 334, pages 281-282 (1992). An Official translation is submitted with this reference. Ondruschka et al describe the reaction of dibenzyl ether with acetic anhydride at high temperature and pressure to yeild benzyl acetate and some side products, like toluene and benzaldehyde.

Benzyl acetate is a carboxylic acid benzyl ester of the formula depicted in instant claim 1, wherein R<sup>4</sup> is methyl, and acetic anhydride is a carboxylic anhydride of the formula depicted in instant claim 1 wherein R<sup>4</sup> is methyl also.

Ondruschka et al, reference at pages 5 and 6, that at lower temperatures, benzyl acetate forms by an "ionic mechanism," while at higher temperatures, toluene and benzaldehyde form by a radical chain mechanism.

Diagrams for each of these respective mechanism are depicted at page 6 of the Ondruschka et al translation (the diagrams in the translation are a bit blurry, so applicants' attention is directed to page 282 of the German-language reference to

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inspect these diagrams). One can clearly see that in the "ionic mechanism" derived by Ondruschka et al for the reaction of dibenzyl ether with acetic anhydride, the key first step is protonation of the dibenzyl ether by acetic acid (in "graphic formula 1," as it is named in the translation), which causes the protonated ether to split into benzyl alcohol and a benzyl acetate molecule, via reaction of the protonated ether with acetate ion. The benzyl alcohol thus formed is then able to react with a molecule of acetic anhydride, which in turn generates one more mole of benzyl acetate and one mole of acetic acid in protonated form, which acetic acid may participate in the initial protonation of benzyl ether to begin the process again. In this reaction mechanism, acetic acid (which is present in small amount in a solution of pure acetic anhydride, in equilibrium with the anhydride) functions as a *de facto* catalyst, because the proton it donates is what initiates the reaction sequence. The last event in the reaction mechanism re-generates the acetic acid molecule in protonated form. Thus, since the initial protonation of dibenzyl ether is acid-dependent, and in the last reaction, step, that acid is re-generated, acetic acid serves as a catalyst in the mechanism proposed by Ondruschka et al. The limitation of instant claim 1 requiring that at least one acid catalyst be present in the reaction is therefore met by Ondruschka et al's experiments.

Ondruschka et al report that their experiments are carried out at a temperature of from 200-250°C (page 5 of the translation, 9 lines up from the bottom of the page), so claim 9 is anticipated by the reference.

Claim 2 is included in this rejection because the claim has been examined on the merits as though "pH" in the case of that claim refers to whether some solution of the

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acidic catalyst specified in claim 1 is obtainable having a pH in the range specified.

Indeed, some solution of acetic acid, which is the *de facto* catalyst, is obtainable having a pH in the range of from 1 to 6.

Claims 1, 2 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by DD 286 577 (Wallach et al).

The Wallach et al discloses the same chemical process as is taught in Ondruschka et al. Ondruschka is listed as a co-inventor on the Wallach et al patent.

The same acetic-acid catalyzed process is occurring in Wallach et al's patent, that is, synthesis of benzyl acetate from dibenzyl ether and acetic anhydride. The abstract, which is in English, says as much.

Benzyl acetate is a carboxylic acid benzyl ester of the formula depicted in instant claim 1, wherein R<sup>4</sup> is methyl, and acetic anhydride is a carboxylic anhydride of the formula depicted in instant claim 1 wherein R<sup>4</sup> is methyl also.

Since a work by one of the co-inventors of Wallach et al has been translated, which work discloses the same chemical process, no translation is deemed necessary for an understanding of the Wallach et al patent, especially since the abstract is in English. Example 1 (page 1, bottom) in Wallach et al was conducted at a temperature of 460K, which is equal to 186°C, so the limitation of instant claim 9 is met by Wallach et al.

Claim 2 is included in this rejection because the claim has been examined on the merits as though "pH" in the case of that claim refers to whether some solution of the



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acidic catalyst specified in claim 1 is obtainable having a pH in the range specified.

Indeed, some solution of acetic acid, which is the *de facto* catalyst, is obtainable having a pH in the range of from 1 to 6.

Claims 1-3 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,800,780 (Ooms et al).

The 102(e) date of the Ooms et al patent is the date the PCT upon which that patent is based was filed, which date is 19 March 2001, before the U.S. filing date of the instant application.

Example 5 of Ooms et al discloses a process whereby benzyl acetate is obtained by reaction of acetic anhydride with dibenzyl ether in the presence of sulfuric acid as a catalyst. Sulfuric acid is specified in instant claim 3, and as is explained in the preceding two rejections under this statute, instant claim 2 is included in this rejection because some solution of sulfuric acid is obtainable having a pH in the range of from 1 to 6. The reaction in Ooms et al's Example 5 is carried out at a temperature of 100°C, which meets the limitation of instant claim 9.

Benzyl acetate is a carboxylic acid benzyl ester of the formula depicted in instant claim 1, wherein R<sup>4</sup> is methyl, and acetic anhydride is a carboxylic anhydride of the formula depicted in instant claim 1 wherein R<sup>4</sup> is methyl also.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

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F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3 and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 and 12 of U.S. Patent No. 6,800,780, which names the two co-inventors of the instant application in addition to a third co-inventor and is commonly assigned. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-3 and 12 of the patent anticipate (that is, they are narrower in scope than) claims 1-3 and 9 of the instant application.

#### ***Information Disclosure Statement***

Signed and initialed forms PTO 1449, submitted with the Information Disclosure Statements filed 17 September 2003 and 19 July 2004 are enclosed herewith. Items "AR," "AS" and "AT" on page 1 of the PTO 1449 form accompanying the IDS submitted 19 July 2004, and items "AS" and "AT" on page 3 of the PTO 1449 form accompanying the same IDS were lined through and have not been considered. "AR," "AS" and "AT" on the first page of the PTO 1449 form accompanying the IDS filed 19 July 2004 were not in the file, and items "AS" and "AT" on page 3 of the same form were not compliant with 37 C.F.R. 1.98(3)(ii)(b)(5), because no publication date was listed. The references

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did not include a publication date, so the examiner could not fill in this missing information on the form.

Since the examiner had to obtain a copy of item "AR" on the first page of the PTO 1449 form accompanying the IDS filed 19 July 2004 (the "Clark" reference), it is cited on a PTO 892 form and is supplied with this Office action. This reference is relied upon in a claim rejection.

The references which have been lined through will gladly be considered if they are supplied, or cited properly on a PTO 1449, whichever applies.

***Allowable Subject Matter***

Claims 4-8 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Cancellation of claims 2 and 10 is recommended.

The prior art does not teach or suggest a process such of making a benzyl carboxylic acid ester from dibenzyl ether and a carboxylic anhydride, wherein the acidic catalyst is either a heteropolyacid compound or an acidic ion exchange resin.

***Conclusion***

Any inquiry concerning this communication should be directed to Zachary Tucker whose telephone number is (571) 272-0677. The examiner can normally be reached Tuesday-Thursday from 8:00am to 4:30pm or Monday from 6:00am to 1:30pm. If Attempts to reach the examiner are unsuccessful, contact the examiner's supervisor, James O. Wilson, at (571) 272-0661.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

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